



# UNITED STATES PATENT OFFICE

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EARTH ANCHOR

Application filed February 13, 1932. Serial No. 592,695.

This invention relates to certain new and useful improvements in expansible earth anchors for use, more particularly, in holding the guy or brace wires of telegraph and telephone poles.

The general objects of the invention are to produce an earth anchor which will be securely held in its expanded condition when embedded in the ground; and to provide novel means to enable the anchor rod to be readily and securely connected to the anchor.

The invention is illustrated in the accompanying drawing, in which:—

Figure 1 is a vertical sectional view showing the anchor placed in position at the bottom of a hole dug in the ground, and showing the position of the parts prior to expanding the wings of the anchor;

Figure 2 is a similar view showing the position of the parts after the wings of the anchor have been expanded into engagement with the walls of the hole;

Figure 3 is a bottom plan view, viewed in the direction of the arrow in Figure 2;

Figure 4 is a cross sectional view on an enlarged scale taken on the line 4—4 of Figure 3;

Figure 5 is a cross sectional view on an enlarged scale, taken on the line 5—5 of Figure 2, illustrating one form of the connection of the anchor rod with the anchor;

Figure 6 is a view partly in side elevation and partly in section, showing a modification in the way of connecting the anchor rod to the anchor; and

Figure 7 is a cross sectional view on an enlarged scale taken on the line 7—7 of Figure 6.

Referring now to the drawing, the numerals 1, 2, indicate the two wings of the anchor, which are pivotally connected to each other at 3 on either side of a screw-rod, 4, having on its upper end a rectangular socket head, 5. Each of the wings is cut away centrally at its inner end to provide a space 6, Figure 5, and each wing has a shoulder, 7, engaging the opposite wing, to limit the outward movement of the wings so as to prevent the wall of the opening 6 from binding against the screw-rod 4. The anchor proper,

therefore, is free at all times to move over the screw-rod 4. Mounted on, and having screw-threaded engagement with the screw-rod 4, is a triangular wedge-block, 8, Figures 1, 2, 3 and 4, the inclined sides of which are on the upper side of the wedge-block. This wedge-block is designed to be forced into engagement with the under sides of the wings 1 and 2 to turn them outwardly and to hold them firmly in their expanded position. To this end, I provide the following construction.

The under side of each of the wings 1, 2, is provided with parallel ribs, 9, which, as shown by Figure 3, are spaced apart a sufficient distance to receive the wedge block between them. The underside of each wing between the ribs 9 is provided with stepped projections, or locking teeth, 10, which are adapted to be engaged by similar teeth, 11, formed on the inclined, or upper sides, of the wedge-block 8. Thus, when the screw-rod 4 is turned clock-wise, or downwardly, the wedge-block 8 will engage the under sides of the wings 1, 2, and force them outwardly until the lugs 7 on the wings prevent further movement thereof, further turning of the screw-rod then forcing the teeth 11 on the wedge-block into engagement with the teeth 10 on the two wings. This engagement of the teeth 10 and 11 operates to hold the wings firmly in their expanded position, and to prevent any tendency of the wings to collapse.

It is necessary to secure the lower end of an anchor rod, 12, in the anchor, the anchor rod, of course, being adapted, as usual, to project above the ground and being provided at its upper end with an eye (not shown) to which one end of a guy wire is secured.

Prior to my invention, it has been proposed to screw the lower end of the anchor rod 12 into the socket head 5. This, however, is objectionable, for the reason that if this is attempted to be done after the anchor is lowered into the hole, it is quite difficult to properly insert the screw-threaded end of the anchor rod in the screw-threaded opening of the socket head 5, and very frequently the attempts to do this have resulted in cross-

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cutting the threads at this point and making the connection of the rod with the head insecure. Even if the anchor rod is screwed into the head 5 before the anchor is lowered into the hole, there is always the danger that careless workmen will cross-cut the threads in screwing the rod into position; and, moreover, even if this operation is properly performed, it has been found that the screw-threaded connection will not hold under all conditions of strain, and there is a liability of the threads breaking, and the anchor rod being pulled out of the anchor.

According to the preferred form of the invention, the socket head 5 is open on one side, as indicated in Figures 1, 2 and 5, and is provided with a central, longitudinal recess, 13, which terminates in an enlarged recess, 14, at the lower end of the head. The bottom of the latter, is, of course, rigidly secured to the upper end of the screw rod 4. In fact, it is, or may be, cast integral with the screw rod. The lower end of the anchor rod 12 is provided with a head, 15, Figures 2 and 5, which is of a size to be received into the recess 14 in the socket head, the longitudinal recess 13 being of a size to snugly receive the portion of the rod 12 extending above the head 15. In connecting the anchor rod 12 with the socket head, its lower end is inserted sidewise, so that the head 15 thereon fits into the recess 14, after which a rectangular ferrule, or keeper, 16, Figures 2 and 5, is driven down on the socket head into firm frictional engagement with the walls thereof, to prevent removal of the head 15 from its socket. As shown by Figure 2, the socket head 5 is formed with an upward taper, so that the keeper 16 when driven down may be firmly engaged therewith.

In Figures 6 and 7, I have shown a modification in the way of securing the anchor rod in the socket head. In this form of the invention, the recess 14 is formed rectangular, as indicated at 17, and a rectangular nut 18 is inserted therein, after which the lower end of the anchor rod 12, which is screw-threaded, as indicated at 19, is screwed into the nut. The keeper 16 is then driven into engagement with the socket head about the nut, as before.

I have found that the use of cut or machined threads on the screw rod 4 are objectionable, for the reason that there is danger of cross-cutting the threads, and it is also desirable to have a somewhat looser fit between the threads on the screw rod and the female threads in the wedge-block than obtains when cut threads are employed. To this end, as more clearly illustrated in Figure 4, I employ on the screw rod what I term "rolled" threads, 20 which are formed by casting the threads as a part of the rod. These threads, as shown, are rounded, and the spaces 21 between them are of greater width than the width of the threads. Corresponding female

threads are, of course, cast in the wedge block. This arrangement, in effect, increases the pitch of the threads and enables the wedge block to be moved much more rapidly into position than when cut threads are employed. Likewise, due to the rounded character and spacing of the threads, there is not the same degree of frictional engagement between these threads and the female threads in the wedge-block as would obtain in the case of cut threads, with the result that the screw rod may be turned with the expenditure of a minimum of power, and the wedge block will be easily and rapidly moved upward on the same.

For turning the screw rod 4, I employ a tubular member, 22, Figure 1, which may be a section of pipe, the lower end of which is formed with a rectangular socket to fit over the socket head 5. If the anchor rod 12 is first secured in the socket head, the tubular member 22 is simply passed over the rod into engagement with the socket head, and after the anchor has been expanded to the position shown in Figure 2, the tubular member is removed.

It remains to state that when inserting the anchor into the hole formed in the ground, I find it desirable to temporarily connect the lower ends of the wings 1, 2, with the outer ends of the wedge block 8, by passing pieces of wire through the holes formed in these members and twisting the wire, as indicated at 24 in Figure 1, to keep the wings from swinging out and obstructing the downward movement of the anchor. These pieces of wire are readily broken when the wedge block is forced upward into engagement with the wings of the anchor.

I claim:

1. An earth anchor comprising, in combination, a pair of wings pivotally connected together at their inner ends, a screw-rod loosely mounted in a space provided between said inner pivoted ends, a wedge block mounted on said screw-rod and adapted to be moved into engagement with the under sides of said wings to expand the same by turning said screw-rod, a socket head secured on the upper end of said screw-rod having an open-sided, a shouldered recess provided therein, an anchor rod adapted to have its lower end inserted in said recess and provided with a member for engaging the shoulders thereof, and a keeper inserted on said socket head and adapted to be forced into rigid frictional engagement therewith to prevent the removal of the lower end of said anchor rod from the socket head.

2. An earth anchor comprising, in combination, a pair of wings pivotally connected together at their inner ends, a screw-rod loosely mounted in a space provided between said pivoted inner ends, a triangular wedge block mounted on said screw-rod and adapted-

ed to have its inclined sides moved into en-  
gagement with the under sides of said wings  
to expand the same by turning said screw-  
rod, a rectangular socket head secured on the  
6 upper end of said screw-rod and provided  
with a shouldered recess open at one side  
and being tapered upwardly, an anchor rod  
adapted to have its lower end inserted later-  
ally into said recess and provided with a  
10 head adapted to engage the shoulders there-  
of, and a keeper inserted on said socket head  
and adapted to be driven into rigid, fric-  
tional engagement with the tapered walls  
thereof to prevent removal of the lower head-  
15 ed portion of the anchor rod from said socket  
head.

In testimony whereof, I have hereunto set  
my hand.

VOTAW S. DURBIN.

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